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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/551,271

09/28/2005

Masahiro Tada

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EXAMINER

TSAI, H JEY

ART UNIT

PAPER NUMBER

2895

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/551,271	<b>Applicant(s)</b> TADA ET AL.	
	<b>Examiner</b> H.Jey Tsai	<b>Art Unit</b> 2895	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 September 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-5 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                        | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

***Claim Objections***

Claim 5 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. A film-formation treatment by sputtering does not further limit the subject matter.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brunner 2005/0221528, previously cited, in view of Murakami 4,838,088 or Cady 4,262,399, newly cited and Wolf, vol. 1, pages 331-332, previously cited.

The references teach the feature:

Brunner discloses a method for manufacturing a micromachine including an oscillator, comprising:

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a step of forming a sacrifice layer 209, 205 around a movable portion of the oscillator 206; para. 26, 37-49, figs 3a-3f,

the sacrifice layer 209, 205 comprising silicon oxide, para. 40, 38,

a step of covering the sacrifice layer with an overcoat film 211,

followed by the formation of a penetrating hole 213 reaching the sacrifice layer 209, 205 in the overcoat layer 211;

a step of performing sacrifice-layer etching for removing the sacrifice layer 209, 205 using the penetrating hole 213 in order to form a space around the movable portion 206; and

a step of performing a film-formation treatment at a reduced pressure (vacuum and sputtering) following the sacrifice-layer etching so as to form a sputtering layer that seals the penetrating hole into a wiring layer, para.46 and see.

wherein the sputtering layer 242 is composed of one selected from the group of an aluminum copper film And an aluminum silicon film, para. 46.

Regarding claim 2, wherein the method is applied to a micromachine having means for driving oscillation in the oscillator, para. 26, 46 of Brunner.

Regarding claim 5, wherein the film-formation treatment at a reduced pressure is a film-formation treatment by sputtering, para. 46, 56, 60 of Brunner.

The difference between the references applied above and the instant claim(s) is: Bruner teaches at para. 46, 40 , 38, 60, using sputtering aluminum for film-formation treatment in vacuum to seal the penetration hole and doped silicon oxide for sacrificial layer 209 and 205 but does not teach the sputtering aluminum sealing metal form as

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wiring layer. However, Murakami teaches at figs. 9F-9H, 3E, col. 4, lines 20-28, using sputtering metal 28 in vacuum to seal the penetration hole 59 or 27 and into the wiring layer (upper electrode) to connect to layer 30. Cady teaches at fig. 1d, 3c, col. 2, lines 59-61, using sputter metal 17 to seal penetration hole 15 and into the wiring layer to connect to bias voltage. Bruner also teaches at para. 10, preferably the silicon oxide is silicon dioxide; when silicon oxide is referred to in this document, silicon dioxide is the most preferred embodiment, although conventional, doped and/or non-stoichiometric silicon oxides are also contemplated. Wolf teaches at vol. 1, pages 331-332, aluminum alloy including Al-Cu and Al-Si are more frequently used than pure aluminum in microelectronic application because they possess enhanced properties for interconnect requirement.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above Brunner's teachings' process by using sputtering metal for sealing the penetration hole and as a wiring layer as taught by Murakami or Cady because the electrical connection can be made from penetration hole to other circuits formed on the same substrate.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above Brunner's teachings' process by using sputtering deposition for metal deposition and using conventional aluminum alloy including aluminum copper or aluminum silicon for metal film formation as taught by Wolf et al. because both aluminum copper and aluminum silicon possess enhanced properties for interconnect requirement in microelectronic application so that all metal

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layers in the microelectronic mechanical device would have enhanced aluminum property.

Claims 3-4 are rejected under 35 U.S.C 103 as being unpatentable over Brunner in view of Murakami or Cady and Wolf as applied to claims 1-2 and 5 above, and further in view of Zurn 6,621,134, and Schmid 6,761,068, previously cited.

The difference between the references applied above and the instant claim(s) is: Brunner in view of Murakami or Cady and Wolf et al. teaches forming a MEMS device having an oscillator but does not teach the means for driving the oscillation. However, Zurn teaches at figs. 4A-4B, 10, 11, 14, 15, 19, an electrostatic capacitive MEMS structure for driving a resonator (oscillator) and sealing penetration hole 144 with metal. Schmid teaches at col. 4, lines 1-12, means for driving oscillation are static electric or piezoelectric.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings by using static electric or piezoelectric for driving oscillation as taught by Zurn and Schmid because static electric and piezoelectric would cause the movable portion of the device to oscillate so that a oscillation is formed.

### ***Conclusions***

Applicant's arguments filed Sept. 23, 2009 have been fully considered but they are not persuasive. Because newly cited reference Murakami and Cady teaches forming a wiring layer having one end of wire that seals the penetration hole as set forth above. Brunner and Murakami teach forming sealing metal layer with sputtering deposition under vacuum as set forth above.

Since, Bruner teaches using sputtering aluminum for film-formation treatment in vacuum to seal the penetration hole, Murakami teaches using sputtering metal in vacuum to seal the penetration hole and into the wiring layer, Cady teaches using sputtering metal in vacuum to seal the penetration hole and into the wiring layer, Wolf teaches aluminum alloy including Al-Cu and Al-Si are more frequently used than pure aluminum in microelectronic application, Zurn teaches an electrostatic capacitive MEMS structure for driving a resonator (oscillator) and sealing penetration hole with metal. Schmid teaches means for driving oscillation are static electric or piezoelectric, hence the combination of Bruner, Murakami, Cady, Zurn and Schmid is proper. Therefore, it is clearly that the combination of Bruner, Murakami, Cady, Zurn and Schmid meets the doctrine of U.S. Supreme Court in KSR international v. Teleflex of "a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability". And, it is also clearly that the combination of Bruner, Murakami, Cady, Zurn and Schmid meets the doctrine of U.S. Supreme Court in KSR international v. Teleflex of "If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103". Also see MPEP §2143.

It is common sense that familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle. See *KSR international v. Teleflex*, US Supreme Court, 127 S.Ct. 1727 (2007). And, see *Ball Aerosol v. Limited Brands, Inc.*, 555 F.3<sup>rd</sup> 984, 89 U.S.P.Q. 2d 1870 (Fed Cir. 2009). *Boston Scientific Scimed, Inc. v. Cordis Corp.*, 554 F.3d 982, 89 U.S.P.Q. 2d, 1704 (Fed. Cir. 2009).

More details of U.S. Supreme Court in *KSR international v. Teleflex*, US Supreme Court, 127 S. Ct. 1742, 82 USPQ 2d at 1390. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility. When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense. In that instance the fact that a combination was obvious to try might show that it was obvious under §103.

When a work is available in one field, design incentives and other market forces can prompt variations of it, either in the same field or in another. If a person of ordinary skill in the art can implement a predictable variation, and would see the benefit of doing so, §103 likely bars its patentability. Moreover, if a technique has been used to improve one device, and a person of ordinary skill in the art would

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recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond that person's skill.

It is common sense that familiar items may have obvious uses beyond their primary purposes, and a person of ordinary skill often will be able to fit the teachings of multiple patents together like pieces of a puzzle. See *KSR international v. Teleflex*, US Supreme Court, 127 S.Ct. 1727 (2007).

In *Sakraida v. AG Pro, Inc.*, 425 U. S. 273(1976), the Court derived from the precedents the conclusion that when a patent simply arranges old elements with each performing the same function it had been known to perform and yields no more than one would expect from such an arrangement, the combination is obvious. *Id.*, at 282. The principles underlying these cases are instructive when the question is whether a patent claiming the combination of elements of prior art is obvious. When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, §103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Richards can be reached on (571) 272-1736.

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The fax phone number for this Group is 571-273-8300.

/H.Jey Tsai/

Primary Examiner, Art Unit 2895

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